

**REMARKS**

**Preliminarily, Applicants respectfully request the Examiner to return initialed Form PTO/SB/08 A & B (modified) for the Information Disclosure Statement filed April 27, 2005.**

Claims 1 and 11 have been amended to recite that the cleaning gas contains SF<sub>6</sub> in an amount of about 0.5 - 4.5 vol %. Support is found, for example, by reference to the cleaning gas of Example 1 of Table 1 at page 16 of the specification (containing SF<sub>6</sub> in an amount of 1/202 ≈ 0.5 vol % and in the cleaning gas of Example 8 of Table 9 at page 21 of the specification (1/22 ≈ 4.5 vol %).

Entry of the amendment at this stage of prosecution is respectfully requested as placing the case in condition for allowance.

Review and reconsideration on the merits are requested.

Claims 1-6, 8-18 and 20-22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,106,790 to Hsiung et al. The grounds for rejection remain the same as set forth in the previous Office Action. Particularly, the Examiner considered Hsiung et al. as teaching a gas comprising SF<sub>6</sub>, F<sub>2</sub>, NF<sub>3</sub>, O<sub>2</sub>, N<sub>2</sub> and CF<sub>4</sub>. Although acknowledging that Hsiung et al. does not specifically teach a gas having the claimed relative volume ratio ranges, the Examiner cited Hsiung et al. as teaching a NF<sub>3</sub>/N<sub>2</sub> ratio that is said to fall within the presently claimed range. The Examiner further considered such disclosure as suggesting that the gas mixture of Hsiung et al. would have a ratio falling within the claimed ranges. Based thereon, the

Examiner considered that it would have been obvious to set the gas components to within the claimed ranges in the absence of a showing of criticality or unexpected results.

Applicants traverse, and respectfully request the Examiner to reconsider in view of the amendment to the claims and the following remarks.

As noted in the Amendment filed January 19, 2005, Hsiung et al. does not disclose a cleaning gas for removing unnecessary deposits in semiconductor production equipment, but rather relates to a process for destroying or abating  $\text{NF}_3$  contained in a semiconductor exhaust stream. Hsiung et al. also does not specifically describe or suggest a gas comprising an inert gas with any of the claimed combinations of  $\text{SF}_6$  and  $\text{F}_2$ ;  $\text{SF}_6$  and  $\text{NF}_3$ ; or  $\text{SF}_6$ ,  $\text{F}_2$  and  $\text{NF}_3$  that the inventors found to be highly efficient as a cleaning gas. Additionally, one of ordinary skill could not arrive at the claimed ratio ranges based on Hsiung et al. because there are no parameters to attach to exhaust gas. Namely, exhaust gas is whatever happens to be generated during the course of manufacturing. Furthermore, because Hsiung et al. has absolutely nothing to do with a cleaning gas, there is nothing that would lead one of ordinary skill to determine an optimum or workable range for a cleaning gas.

Regarding the passage at page 12, lines 7-18 cited by the Examiner, the specification at page 10, lines 2-20 also describes that when used in production processes of semiconductor production equipment or liquid crystal devices, the gas preferably contains the active gas components in a large amount. However, too high a content can damage the equipment material when subjected to the plasma atmosphere. On the other hand, if the amount added is too small, the effect is disadvantageously low.

The point is that the cleaning gas must contain sufficient active components and in an appropriate ratio in order to suitably function as a cleaning gas, which ratios cannot be derived from Hsiung et al. Moreover, there is no control over composition or volume ratio in an exhaust gas such that it is unreasonable to arrive at a composition which suitably functions as a cleaning gas based on Hsiung et al.

Applicants consider the present claims to be patentable for the above reasons alone. However, to more clearly distinguish over Hsiung et al., claims 1 and 11 have been amended to recite an absolute range for the SF<sub>6</sub> concentration in the cleaning gas, whereas the claims as originally filed define a relative ratio of components. As noted above, in order to constitute a cleaning gas, the cleaning gas itself must contain the active gas components in sufficient amount. Accordingly, the claims have been amended to require an absolute range for the SF<sub>6</sub> concentration, based on the working examples, which clearly distinguishes over Hsiung et al. Namely, there is nothing in Hsiung et al. that would lead one of ordinary skill to prepare a cleaning gas having a SF<sub>6</sub> content as claimed. Furthermore, one of ordinary skill would never expect such high SF<sub>6</sub> content in an exhaust gas in any event.

In summary, Hsiung et al. teaches a process for destroying NF<sub>3</sub> in a gas comprising NF<sub>3</sub>, N<sub>2</sub>, O<sub>2</sub>, F<sub>2</sub>, CF<sub>4</sub>, CHF<sub>3</sub>, SF<sub>6</sub> and C<sub>2</sub>F<sub>6</sub> by contacting the gas with metal particles capable of reacting with NF<sub>3</sub>. However, Hsiung et al. does not disclose the cleaning gas of the present invention for removing unnecessary deposits in semiconductor production equipment.


In addition, in view of the amendment to claims 1 and 11, there is nothing in Hsiung et al. that would lead one of ordinary skill to prepare a cleaning gas having a SF<sub>6</sub> content as claimed. Furthermore, one would not expect such high SF<sub>6</sub> content in an exhaust gas in the first instance.

Upon allowance of product claims 1 and 11, Applicants respectfully request rejoinder of withdrawn method claims 22-27 which include all of the limitations of claim 1 and rejoinder of withdrawn method claims 28-36 which include all of the limitations of claim 11. Rejoinder is requested pursuant to MPEP § 821.04 which provides that Applicants are entitled to rejoinder of withdrawn process claims which depend from or otherwise include all of the limitations of the allowable product claims.

In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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